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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,509	11/30/2005	Fumitsugu Fukuyo	46884-5388 (211285)	4531

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EXAMINER	
ULLAH, ELIAS	
ART UNIT	**PAPER NUMBER**
2892	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/537,509	FUKUYO ET AL.	
	Examiner	Art Unit	
	ELIAS ULLAH	2892	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/11/2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 7-59* is/are pending in the application.

4a) Of the above claim(s) *23-32,40 and 41* is/are withdrawn from consideration.

5)☒ Claim(s) *1-5,7-22 and 33-39* is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/13/09, 8/22/09, 11/8/09 and12/9/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/11/2009 has been entered.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-38 of U.S. Patent No. 6,992,026 in view

of Umehara et al. (Umehara, US 5,882,956). Although the conflicting claims are not identical, they are not patentably distinct from each other because the limitation as recited in the claims of the instant application is recited in the noted claims of the '026.

4. With regard to claims 1, 3-4, 19 and 21-22, Fukuyo teaches a substrate dividing method comprising the method of cutting a semiconductor substrate (claim 1), the method comprising the steps of irradiating a semiconductor substrate (claim 1), having a wavelength (claim 2) that enables the laser light (claim 2) to transmit through the semiconductor substrate (claim 1), while locating a light-converging point (claim 1) within the semiconductor substrate, so as to form a modified region caused by photon absorption (claim 1) within the semiconductor substrate, the modified region forming a part which is intended to be cut (claim 1); Fukuyo fails to teach a sheet bonded thereto by way of a die- bonding resin layer with laser light and expanding the sheet forming the part which is intended to be cut, to cut and separate the semiconductor substrate with the die-bonding resin layer bonded thereto into adjacent separated portions of the semiconductor substrate each having at least a portion of the die-bonding resin layer bonded thereto, so as to form a gap between the adjacent portions of the semiconductor substrate, so as to cut and separate at least the semiconductor substrate and die bonding resin layer along the part which is intended to be cut.

5. However, Umehara teaches a sheet 10 (Fig. 10) bonded thereto by way of a die-bonding resin layer 3 and expanding the sheet 10 (col. 7, lines 5-10) forming the part which is intended to be cut (Fig.4), to cut and separate the semiconductor substrate 6 (Fig. 6) with the die-bonding resin layer 3 bonded thereto into adjacent separated

portions of the semiconductor substrate 4 (Fig. 4) each having at least a portion of the die-bonding resin layer bonded thereto, so as to form a gap (Fig. 4 with respect to Fig. 5) between the adjacent portions of the semiconductor substrate 6, so as to cut and separate at least the semiconductor substrate6 and die bonding resin layer 3 along the part which is intended to be cut (Fig. 5). At the time the invention was made, it would have been obvious to a person having ordinary skill in the art to attach an expandable sheet to Fukuyo's wafer because such an expandable sheet helps a semiconductor into IC chips as taught by Umehara in (col. 2, lines 60-65).

Claim Objections

6. Claim 36 is objected to because of the following informalities: in claim 36, lines 21, recites “cut cut” wherein "cut cut” need to change to “cut”.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1, 3-5, 7, 9-15, 17-19, 21-22, 33, 35-37, 39, 42-46, 48-50, 52-53, 55-57, and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoekstra et al. (Hoekstra, US 6,420,678) in view of Umehara et al (Umehara, US 5,882,956) of record.

With regard to claims 1, 3, and 42 Hoekstra teaches a substrate dividing method comprising the method of cutting a semiconductor substrate, the method comprising the steps of irradiating a semiconductor substrate 4 (Fig. 4, lines 59-61), having a wavelength (col. 6, lines 24-27) that enables the laser light 34 (Fig. 4, col. 5, lines 45-50) to transmit (at wave length of 1.06 um a laser light can transmit through the substrate which is identical applicant disclosed wave length (see [0066] of instant application publication 2006/0148212) through the semiconductor substrate 4, while locating a light-converging point 35 within the semiconductor substrate 4, so as to form a modified region (wherein void 37 is formed), the modified region forming a part which is intended to be cut 45 (Fig. 4 with respect to Fig. 16);

Hoekstra further teaches a sheet 112, but fails to teach the sheet bonded thereto by way of a die- bonding resin layer and expanding the sheet forming the part which is intended to be cut, to cut and separate the semiconductor substrate with the die-bonding resin layer bonded thereto into adjacent separated portions of the semiconductor substrate each having at least a portion of the die-bonding resin layer bonded thereto, so as to form a gap between the adjacent portions of the

semiconductor substrate, so as to cut and separate at least the semiconductor substrate and die bonding resin layer along the part which is intended to be cut.

Umehara teaches a sheet 10 (Fig. 10) bonded thereto by way of a die- bonding resin layer 4 and expanding the sheet (col. 3, lines 40-45) forming the part which is intended to be cut (Fig. 4), to cut and separate the semiconductor substrate 6 (Fig. 4 with respect to Fig. 5) with the die-bonding resin layer 4 bonded thereto into adjacent separated portions of the semiconductor substrate 6 (Fig. 5) each having at least a portion of the die-bonding resin layer 4 bonded thereto, so as to form a gap (Fig. 4 with respect to Fig. 5) between the adjacent portions of the semiconductor substrate 6 , so as to cut and separate at least the semiconductor substrate 6 and die bonding resin layer 4 along the part which is intended to be cut (Fig. 4-5). At the time the invention was made, it would have been obvious to a person having ordinary skill in the art substitute Hoekstra's expandable bonding sheet 112 with teaching of Umehara's expanding bonding sheet 10 include a bonding layer 4 in the substrate dividing method of Hoekstra because such bonding layer e.g. layer 4 can be used as a interposed between the IC chips and the lead frame to thereby bond the IC chips to the lead frame thus reduce additional bonding steps as taught by Umehara in (col. 1-10).

Umehara fails to teach expressly “expanding the sheet after the part which is intended to be cut." However, selection of any order of performing process steps (before or after) is *prima facie* obvious in the absence of new or unexpected results; In re Burhans, 154 F.2d 690, 69 USPQ 330 (CCPA 1946); In re Gibson, 39 F2d 975, 5 USPQ 230 (CCPA 1930). MPEP 2144.04.

The recitations of "so as to form a substrate modified region due to multiphoton absorption only within the substrate" is only a statement of the inherent properties of the instant process of Nd:YAG laser pulse. The process recited in "laser processing e.g. ND: YAG" is substantially identical (instant application laser process e.g. Nd:YAG laser see [0066] of instant application publication 2006/0148212) to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.02.

With regard to claim 4, Hoekstra teaches a substrate dividing method comprising the method of cutting a semiconductor substrate, the method comprising the steps of irradiating a semiconductor substrate 4 (Fig. 4, lines 59-61), having a wavelength (col. 6, lines 24-27) that enables the laser light 34 (Fig. 4, col. 5, lines 45-50) to transmit (at wave length of 1.06 um a laser light can transmit through the substrate which is identical applicant disclosed wave length (see [0066] of instant application publication 2006/0148212) through the semiconductor substrate 4, such that grooves are not formed by irradiation of the laser light on a laser incident surface of the semiconductor substrate and no molten region is formed on the laser incident surface of the semiconductor substrate (see Fig. 4, and col. 5, lines 55+, wherein in order to form a grove or molten region laser light need to go through the light converging point e.g. 35 first) while locating a light-converging point 35 within the semiconductor substrate 4, so

as to form a modified region (wherein void 37 is formed), the modified region forming a part which is intended to be cut 45 (Fig. 4 with respect to Fig. 16);

Hoekstra further teaches a sheet 112, but fails to teach the sheet bonded thereto by way of a die- bonding resin layer and expanding the sheet forming the part which is intended to be cut, to cut and separate the semiconductor substrate with the die-bonding resin layer bonded thereto into adjacent separated portions of the semiconductor substrate each having at least a portion of the die-bonding resin layer bonded thereto, so as to form a gap between the adjacent portions of the semiconductor substrate, so as to cut and separate at least the semiconductor substrate and die bonding resin layer along the part which is intended to be cut.

Umehara teaches a sheet 10 (Fig. 10) bonded thereto by way of a die- bonding resin layer 4 and expanding the sheet (col. 3, lines 40-45) forming the part which is intended to be cut (Fig. 4), to cut and separate the semiconductor substrate 6 (Fig. 4 with respect to Fig. 5) with the die-bonding resin layer 4 bonded thereto into adjacent separated portions of the semiconductor substrate 6 (Fig. 5) each having at least a portion of the die-bonding resin layer 4 bonded thereto, so as to form a gap (Fig. 4 with respect to Fig. 5) between the adjacent portions of the semiconductor substrate 6 , so as to cut and separate at least the semiconductor substrate 6 and die bonding resin layer 4 along the part which is intended to be cut (Fig. 4-5). At the time the invention was made, it would have been obvious to a person having ordinary skill in the art substitute Hoekstra's expandable bonding sheet 112 with teaching of Umehara's expanding bonding sheet 10 include a bonding layer 4 in the substrate dividing method

of Hoekstra because such bonding layer e.g. layer 4 can be used as a interposed between the IC chips and the lead frame to thereby bond the IC chips to the lead frame thus reduce additional bonding steps as taught by Umehara in (col. 1-10).

The recitations of "so as to form a substrate modified region due to multiphoton absorption only within the substrate" is only a statement of the inherent properties of the instant process of Nd:YAG laser pulse. The process recited in "laser processing e.g. ND: YAG" is substantially identical (instant application laser process e.g. Nd:YAG laser see [0066] of instant application publication 2006/0148212) to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.02.

With regard to claim 5, Hoekstra teaches a method of cutting a semiconductor substrate wherein the modified region (Fig. 4, wherein modified region 37 is formed) is a molten processed region (col. 6, lines 1-3).

With regard to claims 7, 9-10, Hoekstra teaches a method of cutting a semiconductor substrate wherein a fracture is caused to reach a front face of the semiconductor substrate 4 (col. 6, lines 10-15) on the laser light 34 entrance side from the part which is intended to be cut action as a start point (Fig. 4,).

With regard to claims 11, 13-15, and 17-18 Hoekstra teaches a method of cutting a semiconductor substrate wherein a fracture is caused to reach a rear face o the

semiconductor substrate 4 (col. 4, lines 40-50) on the side opposite from the laser light entrance side (col. 4, lines 40-50) from the part which is intended to be cut as a starting point (Fig. 4).

With regard to claims 19, 21 and 43, Hoekstra teaches a substrate dividing method comprising the method of cutting a semiconductor substrate, the method comprising the steps of irradiating a semiconductor substrate 4 (Fig. 4, lines 59-61), having a wavelength (col. 6, lines 24-27) that enables the laser light 34 (Fig. 4, col. 5, lines 45-50) to transmit (at wave length of 1.06 um a laser light can transmit through the substrate which is identical applicant disclosed wave length (see [0066] of instant application publication 2006/0148212) through the semiconductor substrate 4, while locating a light-converging point 35 within the semiconductor substrate 4, so as to form a modified region (wherein void 37 is formed), the modified region forming a part which is intended to be cut 45 (Fig. 4 with respect to Fig. 16); generating a stress (Fig. 16, col. 11, lines 10-25 wherein curve in y direction with small rise in the elevation at the locations where the substrate 4 will be separate create a stress to the semiconductor) in the semiconductor substrate 4 along the part which is intended to be cut after forming the part which is intended to be cut (Fig. 16).

Hoekstra further teaches a sheet 112, but fails to teach the sheet bonded thereto by way of a die- bonding resin layer and expanding the sheet forming the part which is intended to be cut, to cut and separate the semiconductor substrate with the die-bonding resin layer bonded thereto into adjacent separated portions of the semiconductor substrate each having at least a portion of the die-bonding resin layer

bonded thereto, so as to form a gap between the adjacent portions of the semiconductor substrate, so as to cut and separate at least the semiconductor substrate and die bonding resin layer along the part which is intended to be cut.

Umehara teaches a sheet 10 (Fig. 10) bonded thereto by way of a die- bonding resin layer 4 and expanding the sheet (col. 3, lines 40-45) forming the part which is intended to be cut (Fig. 4), to cut and separate the semiconductor substrate 6 (Fig. 4 with respect to Fig. 5) with the die-bonding resin layer 4 bonded thereto into adjacent separated portions of the semiconductor substrate 6 (Fig. 5) each having at least a portion of the die-bonding resin layer 4 bonded thereto, so as to form a gap (Fig. 4 with respect to Fig. 5) between the adjacent portions of the semiconductor substrate 6 , so as to cut and separate at least the semiconductor substrate 6 and die bonding resin layer 4 along the part which is intended to be cut (Fig. 4-5). At the time the invention was made, it would have been obvious to a person having ordinary skill in the art substitute Hoekstra's expandable bonding sheet 112 with teaching of Umehara's expanding bonding sheet 10 include a bonding layer 4 in the substrate dividing method of Hoekstra because such bonding layer e.g. layer 4 can be used as a interposed between the IC chips and the lead frame to thereby bond the IC chips to the lead frame thus reduce additional bonding steps as taught by Umehara in (col. 1-10).

The recitations of “so as to form a substrate modified region due to multiphoton absorption only within the substrate” is only a statement of the inherent properties of the instant process of Nd:YAG laser pulse. The process recited in “laser processing e.g. ND: YAG” is substantially identical (instant application laser process e.g. Nd:YAG laser

see [0066] of instant application publication 2006/0148212) to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.02.

With regard to claim 22, Hoekstra teaches a method of cutting a semiconductor substrate wherein the modified region (Fig. 4, wherein modified region 37 is formed) is a molten processed region (col. 6, lines 1-3).

With regard to claims 33, 35-37, 39 and 44-45, Hoekstra teaches a substrate dividing method comprising the method of cutting a semiconductor substrate, the method comprising the steps of irradiating a semiconductor substrate 4 (Fig. 4, lines 59-61), having a wavelength (col. 6, lines 24-27) that enables the laser light 34 (Fig. 4, col. 5, lines 45-50) to transmit (at wave length of 1.06 um a laser light can transmit through the substrate which is identical applicant disclosed wave length (see [0066] of instant application publication 2006/0148212) through the semiconductor substrate 4, while locating a light-converging point 35 within the semiconductor substrate 4, so as to form a modified region (wherein void 37 is formed), the modified region forming a part which is intended to be cut 45 (Fig. 4 with respect to Fig. 16) generating a stress (Fig. 16, col. 11, lines 10-25 wherein curve in y direction with small rise in the elevation at the locations where the substrate 4 will be separate create a stress to the semiconductor)

in the semiconductor substrate 4 along the part which is intended to be cut after forming the part which is intended to be cut (Fig. 16).

Hoekstra further teaches a sheet 112, but fails to teach the sheet bonded thereto by way of a die- bonding resin layer and expanding the sheet forming the part which is intended to be cut, to cut and separate the semiconductor substrate with the die-bonding resin layer bonded thereto into adjacent separated portions of the semiconductor substrate each having at least a portion of the die-bonding resin layer bonded thereto, so as to form a gap between the adjacent portions of the semiconductor substrate, so as to cut and separate at least the semiconductor substrate and die bonding resin layer along the part which is intended to be cut with such separating thereby providing at least one manufactured semiconductor device

Umehara teaches a sheet 10 (Fig. 10) bonded thereto by way of a die- bonding resin layer 4 and expanding the sheet (col. 3, lines 40-45) forming the part which is intended to be cut (Fig. 4), to cut and separate the semiconductor substrate 6 (Fig. 4 with respect to Fig. 5) with the die-bonding resin layer 4 bonded thereto into adjacent separated portions of the semiconductor substrate 6 (Fig. 5) each having at least a portion of the die-bonding resin layer 4 bonded thereto, so as to form a gap (Fig. 4 with respect to Fig. 5) between the adjacent portions of the semiconductor substrate 6 , so as to cut and separate at least the semiconductor substrate 6 and die bonding resin layer 4 along the part which is intended to be cut (Fig. 4-5), with such separating thereby providing at least one manufactured semiconductor device (col. 2, lines 60-65). At the time the invention was made, it would have been obvious to a person having

ordinary skill in the art substitute Hoekstra's expandable bonding sheet 112 with teaching of Umehara's expanding bonding sheet 10 include a bonding layer 4 in the substrate dividing method of Hoekstra because such bonding layer e.g. layer 4 can be used as a interposed between the IC chips and the lead frame to thereby bond the IC chips to the lead frame thus reduce additional bonding steps as taught by Umehara in (col. 1-10).

The recitations of "so as to form a substrate modified region due to multiphoton absorption only within the substrate" is only a statement of the inherent properties of the instant process of Nd:YAG laser pulse. The process recited in "laser processing e.g. ND: YAG" is substantially identical (instant application laser process e.g. Nd:YAG laser see [0066] of instant application publication 2006/0148212) to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.02.

With regard to claims 46, 48-50, 52-53, 55-57 and 59 Hoekstra fails to teach a substrate dividing method wherein the expanding separates the die bonding resin layer along with the semiconductor substrate.

Umehara teaches a substrate dividing method wherein the expanding separates the die bonding resin layer along with the semiconductor substrate (Fig. 5, wherein IC

chip 6 and resin layer are separates together). See above claim 1 discussions for the motivation.

10. Claims 2, 8, 16, 20, 34, 38, 47, 51, 54 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoekstra et al. (Hoekstra, US 6,420,678); in view of Umehara et al (Umehara, US 5,882,956) of record and further in view of Piwczyk et al. (US 6,376,797) of record.

With regard to claims 2 , 20, 34 and 38 Hoekstra teaches a substrate dividing method comprising the method of cutting a semiconductor substrate, the method comprising the steps of irradiating a semiconductor substrate 4 (Fig. 4, lines 59-61), having a wavelength (col. 6, lines 24-27) that enables the laser light 34 (Fig. 4, col. 5, lines 45-50) to transmit (at wave length of 1.06 um a laser light can transmit through the substrate which is identical applicant disclosed wave length (see [0066] of instant application publication 2006/0148212) through the semiconductor substrate 4, while locating a light-converging point 35 within the semiconductor substrate 4, and the substrate is irradiate with a pulse width of 1us or less (col. 6, lines 26-30) so as to form a modified region (wherein void 37 is formed), the modified region forming a part which is intended to be cut 45 (Fig. 4 with respect to Fig. 16); generating a stress (Fig. 16, col. 11, lines 10-25 wherein curve in y direction with small rise in the elevation at the locations where the substrate 4 will be separate create a stress to the semiconductor) in the semiconductor substrate 4 along the part which is intended to be cut after forming the part which is intended to be cut (Fig. 16).

Hoekstra further teaches a sheet 112, but fails to teach the sheet bonded thereto by way of a die- bonding resin layer and expanding the sheet forming the part which is intended to be cut, to cut and separate the semiconductor substrate with the die-bonding resin layer bonded thereto into adjacent separated portions of the semiconductor substrate each having at least a portion of the die-bonding resin layer bonded thereto, so as to form a gap between the adjacent portions of the semiconductor substrate, so as to cut and separate at least the semiconductor substrate and die bonding resin layer along the part which is intended to be cut with such separating thereby providing at least one manufactured semiconductor device.

Umehara teaches a sheet 10 (Fig. 10) bonded thereto by way of a die- bonding resin layer 4 and expanding the sheet (col. 3, lines 40-45) forming the part which is intended to be cut (Fig. 4), to cut and separate the semiconductor substrate 6 (Fig. 4 with respect to Fig. 5) with the die-bonding resin layer 4 bonded thereto into adjacent separated portions of the semiconductor substrate 6 (Fig. 5) each having at least a portion of the die-bonding resin layer 4 bonded thereto, so as to form a gap (Fig. 4 with respect to Fig. 5) between the adjacent portions of the semiconductor substrate 6 , so as to cut and separate at least the semiconductor substrate 6 and die bonding resin layer 4 along the part which is intended to be cut (Fig. 4-5) and with such separating thereby providing at least one manufactured semiconductor device (col. 2, lines 60-65). At the time the invention was made, it would have been obvious to a person having ordinary skill in the art substitute Hoekstra's expandable bonding sheet 112 with teaching of Umehara's expanding bonding sheet 10 include a bonding layer 4 in the

substrate dividing method of Hoekstra because such bonding layer e.g. layer 4 can be used as a interposed between the IC chips and the lead frame to thereby bond the IC chips to the lead frame thus reduce additional bonding steps as taught by Umehara in (col. 1-10).

The recitations of "so as to form a substrate modified region due to multiphoton absorption only within the substrate" is only a statement of the inherent properties of the instant process of Nd:YAG laser pulse. The process recited in "laser processing e.g. ND: YAG" is substantially identical (instant application laser process e.g. Nd:YAG laser see [0066] of instant application publication 2006/0148212) to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.02.

Hoekstra and Umehara fail to teach the substrate is irradiated with the laser light under a condition with a peak power density of at least 1 x 10^8 (W/cm2).

Piwczyk teaches Nd: YAG laser with a peak power density of 9 x 10^9 W/cm^2 for creating micro crack (col. 4, lines 20-40). At the time the invention was made, it would have been obvious to a person having ordinary skill in the art to use a Nd: YAG laser with a peak power density of 9 x 10^9 W/cm^2 for creating micro crack teaching of Piwczyk in the laser processing method of Hoekstra because Hoekstra Nd: YAG laser (col. 6,

lines 24-30) can be used for a peak power density of 9×10^9 W/cm^2 for creating micro crack for cutting a substrate.

With regard to claim 8, Hoekstra teaches a method of cutting a semiconductor substrate wherein a fracture is caused to reach a front face of the semiconductor substrate 4 (col. 6, lines 10-15) on the laser light 34 entrance side from the part which is intended to be cut action as a start point (Fig. 4).

With regard to claim 16, Hoekstra teaches a method of cutting a semiconductor substrate wherein a fracture is caused to reach a rear face o the semiconductor substrate 4 (col. 4, lines 40-50) on the side opposite from the laser light entrance side (col. 4, lines 40-50) from the part which is intended to be cut as a starting point (Fig. 4).

With regard to claims 47, 51, 54 and 58 Hoekstra fails to teach a substrate dividing method wherein the expanding separates the die bonding resin layer along with the semiconductor substrate.

Umehara teaches a substrate dividing method wherein the expanding separates the die bonding resin layer along with the semiconductor substrate (Fig. 5, wherein IC chip 6 and resin layer are separates together). See above claim 1 discussion for the motivation.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELIAS ULLAH whose telephone number is (571)272-1415. The examiner can normally be reached on weekdays, between 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thao Le can be reached on (571) 272-1708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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